

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of : **Confirmation No. 4023**  
Atsushi YOSHIDA et al. : Attorney Docket No. 2005\_0020A  
Serial No. 10/521,577 : Group Art Unit 2443  
Filed January 18, 2005 : Examiner Mark D. Fearer  
DEVICE LINKAGE CONTROL APPARATUS: **Mail Stop: Amendment**

**SUBMISSION OF CORRECTED CLAIMS SECTION**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Further to response filed September 17, 2008, submitted herewith is a corrected "Amendments to the Claims" section of Amendment filed September 17, 2008. The corrected section is necessary to provide claims 4-5, 10, 14-15, 17-22 and 32-40 with the proper strikethroughs to delete text of five characters or less.

Respectfully submitted,

Atsushi YOSHIDA et al.

/Michael S. Huppert/  
By: 2008.12.23 14:47:12 -05'00'  
Michael S. Huppert  
Registration No. 40,268  
Attorney for Applicants

MSH/kjf  
Washington, D.C. 20006-1021  
Telephone (202) 721-8200  
Facsimile (202) 721-8250  
December 23, 2008

## AMENDMENTS TO THE CLAIMS

### 1-2. (Cancelled)

3. (Currently amended) The device linkage control apparatus according to Claim 32, wherein the episode creation unit creates the plurality of episode data, based on previously stored episode data creation rules, by gathering the element data included in the ~~respective~~ life data accumulated by the life data accumulation unit.

4. (Currently amended) The device linkage control apparatus according to Claim 32, wherein the episode analysis unit ~~structuralizes-determines a structure of~~ an associated use relationship by representing, as [[a]] the frequent pattern tree, an appearance frequency and a combination pattern of the element data included in the plurality of episode data created by the episode creation unit, the frequent pattern tree associating, in each node, a type of the element data and a frequency which indicates [[said]] the appearance frequency.

5. (Currently amended) The device linkage control apparatus according to Claim 4, wherein the episode analysis unit includes:

- a frequency derivation unit operable to calculate [[the]] a frequency of each element data included in the plurality of episode data;
- a sorting unit operable to rearrange the element data within each of the plurality of episode data, in a decreasing order of frequency; and
- a frequent pattern tree generation unit operable to generate, with regard to the plurality of episode data, the frequent pattern tree by sequentially retrieving the element data, and placing the retrieved element data as new nodes in the frequent pattern tree, or incrementing the frequency of an existing node.

6. (Previously Presented) The device linkage control apparatus according to Claim 32, wherein the life pattern interpretation unit generates, as the life pattern information,

information indicating a combination of devices corresponding to nodes that are in a parent-offspring relationship in the frequent pattern tree.

**7. (Currently amended)** The device linkage control apparatus according to Claim 6,

wherein the life pattern interpretation unit includes:

a node detection unit operable to detect a current node in the frequent pattern tree;

a parent node detection unit operable to detect all nodes that are parent nodes of the detected current node; and

a life pattern output unit operable to output, as the life pattern information, information indicating that a device corresponding to the detected parent node and a device corresponding to the current node are in an associated use relationship.

**8. (Cancelled)**

**9. (Currently amended)** The device linkage control apparatus according to Claim 32,

wherein the episode analysis unit includes:

a frequency derivation unit operable to calculate the frequency of each element data included in the plurality of episode data;

a sorting unit operable to rearrange the element data within the each of the plurality of episode data, in a decreasing order of frequency;

a frequent pattern tree generation unit operable to generate, with regard to the plurality of episode data, the frequent pattern tree by sequentially retrieving the element data, and placing the retrieved element data as new nodes in the frequent pattern tree, or incrementing the frequency of an existing node;

a subtree extraction unit operable to separate the generated frequent pattern tree into subtrees having, as new roots, nodes which are offspring of the root of the frequent pattern tree;

an episode re-creation unit operable to create episode data from the separated subtrees;

a reconstruction unit operable to reconstruct the subtrees by repeating, on the created

episode data, the calculation by the frequency derivation unit, the rearrangement by the sorting unit, and the frequent pattern tree generation by the frequent pattern tree generation unit; and  
a subtree combining unit operable to combine the reconstructed subtrees to the ~~original~~frequent pattern tree.

**10. (Currently amended)** The device linkage control apparatus according to Claim 32,

wherein the episode analysis unit includes:

an input episode data storage unit operable to store, as input episode data, the plurality of episode data created by the episode creation unit;

an input episode number determination unit operable to obtain a number of the input episode data stored in the input episode data storage unit;

a most-frequent element identification unit operable to identify the element data with the highest frequency from within each input episode data;

a most-frequent element extraction unit operable to extract the element data with the highest frequency from within each input episode data, and add the extracted element data to output episode data;

an output episode data storage unit operable to store the output episode data;

an input episode classification unit operable to classify the input episode data according to the type of the element data; and

a frequent pattern tree generation unit operable to generate the frequent pattern tree that associates, in respective nodes, the appearance frequency and combination pattern of the element data with the type of the element data and the frequency which indicates ~~[[said]]~~ the appearance frequency, the element data being included in the output episode data stored in the output episode data storage unit.

**11. (Currently amended)** The device linkage control apparatus according to Claim 32, wherein the episode creation unit creates element data ~~respectively~~ indicating a device and the usage time of the device based on the life data, and creates, ~~in the case where~~when the usage times of the

~~respective~~ element data have a fixed inclusive relationship or an overlapping relationship, episode data that includes said ~~respective~~the element data.

**12. (Currently amended)** The device linkage control apparatus according to Claim 32, wherein the episode creation unit creates, based on the life data, event data ~~respectively~~ indicating a device, an event occurring with the device, and an occurrence time of the event, and creates, ~~in the case where~~when the occurrence times of the respective event data have a fixed inclusive relationship or an overlapping relationship, episode data including element data corresponding to the devices indicated by said ~~respective~~the event data.

**13. (Previously Presented)** The device linkage control apparatus according to Claim 6, wherein the life pattern interpretation unit calculates, for each of the nodes that are in the parent-offspring relationship in the frequent pattern tree, a confidence level indicating a degree of an associated use relationship, and generates the life pattern information with only the nodes that are connected with a confidence level that is equal to or higher than a fixed value.

**14. (Currently amended)** The device linkage control apparatus according to Claim 32, wherein, ~~in the case where it is detected that~~when a state of a first device indicated in the life pattern information ~~[[has]]~~ is detected as changed, the control unit causes a state of a second device indicated in the life pattern information to change by controlling the second device.

**15. (Currently amended)** The device linkage control apparatus according to Claim 14, wherein ~~[[a]]~~ the first and ~~[[a]]~~ the second device ~~respectively~~each include a timer, and ~~in the case where it is detected that~~when setting details of the timer included in the first device ~~is~~ are detected as changed, the control unit changes setting details of the timer included in the second device.

**16. (Currently amended)** The device linkage control apparatus according to Claim 15, wherein,

~~in the case where it is detected that~~when a setting of a preset time of the timer included in the first device is detected as changed, the control unit changes a setting of a preset time of the timer included in the second device in such a way that a difference between the times before changing and the times after changing is the same.

**17. (Currently amended)** The device linkage control apparatus according to Claim 14, wherein, ~~in the case where it is detected that~~when the state of the first device indicated in the life pattern information ~~[[has]]~~ is detected as changed, the control unit i) previously generates and records change information indicating that the state of the second device indicated in the life pattern information should be changed, and ii) causes the state of the second device to change by controlling the second device according to the change information after a predetermined time elapses.

**18. (Currently Amended)** The device linkage control apparatus according to Claim 17, wherein the first and the second devices ~~respectively~~ each include a timer, and ~~in the case where it is detected that~~when setting details of the timer included in the first device ~~[[is]]~~ are detected as changed, the control unit i) previously generates and records change information that includes an instruction to change the setting details of the timer included in the second device and a designation for a time for ~~[[said]]~~ the change, and ii) changes the setting details of the timer included in the second device according to the change information ~~when said time comes~~at the time for the change.

**19. (Currently Amended)** The device linkage control apparatus according to Claim 14, wherein the control unit previously stores a plurality of linkage information identifying details of ~~[[the]]~~ control and selection condition information indicating conditions for selecting one linkage information from among the plurality of linkage ~~information; information,~~ and ~~in the case where it is detected that~~when the state of the first device indicated in the life pattern information ~~has is~~ detected as changed, the control unit selects one of the plurality of linkage information by

referring to the selection condition information, and causes the state of the second device indicated in the life pattern information to change, by controlling the second device according to the selected linkage information.

**20. (Currently amended)** The device linkage control apparatus according to Claim 19,  
wherein the first and the second devices ~~respectively each~~ include a timer,  
the linkage ~~image information~~ indicates a difference between preset times of timers included in the first and second devices,  
the selection condition information indicates a correspondence of a setting value of the preset time of the timer included in the first device and the linkage information that ~~[[needs]]~~ is to be selected, and  
~~in the case where it is detected that~~when setting details of the preset time of the timer included in the first device ~~[[is]]~~ are detected as changed, the control unit selects one linkage information corresponding to the changed preset time from among the plurality of linkage information by referring to the selection condition information, and changes the preset time of the timer included in the second device according to the selected linkage information.

**21. (Currently Amended)** The device linkage control apparatus according to Claim 14,  
wherein the first and the second devices ~~respectively each~~ include a timer, and  
~~in the case where it is detected that~~when setting details of the timer included in the first device ~~[[is]]~~ are detected as cancelled, the control unit cancels the setting details of the timer included in the second device.

**22. (Currently Amended)** The device linkage control apparatus according to Claim 14,  
wherein the first and the second devices ~~respectively each~~ include a timer, and  
~~in the case where it is detected that~~when setting details of the timer included in the first device ~~[[is]]~~ are detected as changed, the control unit causes the second device to make a sound output or a display output by controlling the second device, ~~[[said]]~~ the output indicating that

[[said]] the setting details [[is]] are changed.

**23-31. (Cancelled)**

**32. (Currently Amended)** A device linkage control apparatus which identifies a frequency of associated use between devices among a plurality of devices, and controls, in linkage with each other, a set of the devices having a high frequency for being used in association with each other, the apparatus comprising:

a life data accumulation unit operable to accumulate life data indicating a usage history of the plurality of devices;

an episode creation unit operable to create, from the life data, a plurality of episode data, based on episode data creation rules which determine devices that have been used in association with each other, [[said]] the plurality of episode data having, as data, a plurality of the devices that have been used in association with each other;

an episode analysis unit operable to create, from the plurality of episode data, a frequent pattern tree representing, as a tree structure, a frequency at which the ~~respective~~ device sets are used in association with each other;

a life pattern interpretation unit operable to identify, according to the frequent pattern tree, a combination of device sets as life pattern information, [[said]] the device sets having a high frequency for being used in association with each other; and

a control unit operable to control, in linkage with each other, [[said]] the device sets having a high frequency for being used in association with each other,

wherein, with regard to subtrees having ~~respective~~ nodes of the frequent pattern tree as roots, the episode analysis unit constructs the frequent pattern tree with a structure in which element data having a highest frequency becomes a root of a subtree,

the life pattern interpretation unit identifies, based on the frequent pattern tree, a device A and a device B, which have a high frequency for being used in association with each other, as a



combination having a high association frequency, even when each of [[said]] device A and [[said]] device B are combined and used in association with various other devices, and the control unit controls, in linkage with each other, at least [[said]] device A and [[said]] device B, and

wherein the episode analysis unit (i) creates new episodes by extracting subtrees having, as new roots, nodes which are offspring of a node equivalent to a root of the frequent pattern tree, tracking nodes within each of the extracted subtrees starting from the root, and combining element data stored in the nodes, (ii) recursively performs the subtree extraction and the episode creation on the created episodes until there are no more subtrees, and (iii) reconstructs the frequent pattern tree by integrating recursively constructed subtree frequent pattern trees, into positions in the frequent pattern tree.

**33. (Currently Amended)** A device linkage control method, for use in a device linkage control apparatus, for identifying a frequency of associated use between devices among a plurality of devices, and controlling, in linkage with each other, a set of the devices having a high frequency for being used in association with each other, the method comprising:

~~a life data accumulation step of accumulating life data indicating a usage history of the plurality of devices;~~

~~an episode creation step of creating, from the life data, a plurality of episode data, based on episode data creation rules which determine devices that have been used in association with each other, [[said]] the plurality of episode data having, as data, a plurality of the devices that have been used in association with each other;~~

~~an episode analysis step of creating, from the plurality of episode data, a frequent pattern tree representing, as a tree structure, a frequency at which the respective device sets are used in association with each other;~~

~~a life pattern interpretation step of identifying, according to the frequent pattern tree, a combination of device sets as life pattern information, [[said]] the device sets having a high frequency for being used in association with each other; [[and]]~~

a control step of controlling, in linkage with each other, ~~[[said]]~~ the device sets having a high frequency for being used in association with each other, wherein

~~the life data accumulation steps~~said accumulating life data operation, said creating a plurality of episode data operation, said creating the frequent pattern tree operation, said identifying operation, and said controlling operation,~~the episode creation step, the episode analysis step, the life pattern interpretation step, and the control step~~ are executed by the device linkage control apparatus,

with regard to subtrees having respective nodes of the frequent pattern tree as roots, the frequent pattern tree is constructed, in ~~the episode analysis steps~~said creating a frequent pattern tree operation, with a structure in which element data having a highest frequency becomes a root of a subtree,

in ~~the life pattern interpretation steps~~said identifying operation, a device A and a device B which have a high frequency for being used in association with each other are identified, based on the frequent pattern tree, as a combination having a high association frequency, even when each of ~~[[said]]~~ device A and ~~[[said]]~~ device B are combined and used in association with various other devices, and

in ~~the control steps~~said controlling operation, at least ~~[[said]]~~ device A and ~~[[said]]~~ device B are controlled in linkage with each other; and

creating new episodes by extracting subtrees having, as new roots, nodes which are offspring of a node equivalent to a root of the frequent pattern tree, tracking nodes within each of the extracted subtrees starting from the root, and combining element data stored in the nodes;

performing, recursively, the subtree extraction and said creating new episode operation on the created new episodes until there are no more subtrees; and

reconstructing the frequent pattern tree by integrating recursively constructed subtree frequent pattern trees, into positions in the frequent pattern tree.

**34. (Currently Amended)** A program, for use in a device linkage control apparatus, for identifying a frequency of associated use between devices among a plurality of devices, and

controlling, in linkage with each other, a set of the devices having a high frequency for being used in association with each other, the program being held in a storage unit of ~~[[said]]~~ the device linkage control apparatus, and causing a CPU which controls operation of ~~[[said]]~~ the device linkage control apparatus to execute at least the following:

~~a life data accumulation step of accumulating~~ life data indicating a usage history of the plurality of devices;

~~an episode creation step of creating~~, from the life data, a plurality of episode data, based on episode data creation rules which determine devices that have been used in association with each other, ~~[[said]]~~ the plurality of episode data having, as data, a plurality of the devices that have been used in association with each other;

~~an episode analysis step of creating~~, from the plurality of episode data, a frequent pattern tree representing, as a tree structure, a frequency at which ~~the respective~~ device sets are used in association with each other;

~~a life pattern interpretation step of identifying~~, according to the frequent pattern tree, a combination of device sets as life pattern information, ~~[[said]]~~ the device sets having a high frequency for being used in association with each other; ~~[[and]]~~

~~a control step of controlling~~, in linkage with each other, ~~[[said]]~~ the device sets having a high frequency for being used in association with each other, wherein

with regard to subtrees having respective nodes of the frequent pattern tree as roots, the frequent pattern tree is constructed, in ~~the episode analysis step~~ said creating a frequent pattern tree operation, with a structure in which element data having a highest frequency becomes a root of a subtree,

in ~~the life pattern interpretation step~~ said identifying operation, a device A and a device B which have a high frequency for being used in association with each other are identified, based on the frequent pattern tree, as a combination having a high association frequency, even when each of ~~[[said]]~~ device A and ~~[[said]]~~ device B are combined and used in association with various other devices, and

in ~~the control step~~ said controlling operation, at least ~~[[said]]~~ device A and ~~[[said]]~~ device

B are controlled in linkage with each other; and

creating new episodes by extracting subtrees having, as new roots, nodes which are offspring of a node equivalent to a root of the frequent pattern tree, tracking nodes within each of the extracted subtrees starting from the root, and combining element data stored in the nodes;

performing, recursively, the subtree extraction and said creating new episode operation on the created new episodes until there are no more subtrees; and

reconstructing the frequent pattern tree by integrating recursively constructed subtree frequent pattern trees, into positions in the frequent pattern tree.

**35. (Currently Amended)** A device linkage control system comprising a plurality of devices and a control apparatus that are connected to each other by a transmission line, the control apparatus controlling the plurality of devices in linkage with each other,

wherein the control apparatus includes:

a life data accumulation unit operable to accumulate life data indicating a usage history of the plurality of devices;

an episode creation unit operable to create, from the life data, a plurality of episode data, based on episode data creation rules which determine devices that have been used in association with each other, ~~[[said]]~~ the plurality of episode data having, as data, a plurality of the devices that have been used in association with each other;

an episode analysis unit operable to create, from the plurality of episode data, a frequent pattern tree representing, as a tree structure, a frequency at which ~~the respective device sets~~ are used in association with each other;

a life pattern interpretation unit operable to identify, according to the frequent pattern tree, a combination of device sets as life pattern information, ~~[[said]]~~ the device sets having a high frequency for being used in association with each other; and

a control unit operable to control, in linkage with each other, ~~[[said]]~~ the device sets having a high frequency for being used in association with each other,

wherein, with regard to subtrees having ~~respective~~ nodes of the frequent pattern tree as

roots, the episode analysis unit constructs the frequent pattern tree with a structure in which element data having a highest frequency becomes a root of a subtree,

the life pattern interpretation unit identifies, based on the frequent pattern tree, a device A and a device B, which have a high frequency for being used in association with each other, as a combination having a high association frequency, even when each of [[said]] device A and

[[said]] device B are combined and used in association with various other devices, and

the control unit controls, in linkage with each other, at least [[said]] device A and [[said]] device B, and

wherein the episode analysis unit (i) creates new episodes by extracting subtrees having, as new roots, nodes which are offspring of a node equivalent to a root of the frequent pattern tree, tracking nodes within each of the extracted subtrees starting from the root, and combining element data stored in the nodes, (ii) recursively performs the subtree extraction and the episode creation on the created episodes until there are no more subtrees, and (iii) reconstructs the frequent pattern tree by integrating recursively constructed subtree frequent pattern trees, into positions in the frequent pattern tree.

**36. (Currently Amended)** A life pattern information generating apparatus that generates life pattern information for a device linkage control apparatus that controls a plurality of devices in linkage with each other based on the life pattern information, the life pattern information generating apparatus comprising:

a life data accumulation unit operable to accumulate life data indicating a usage history of the plurality of devices;

an episode creation unit operable to create, from the life data, a plurality of episode data, based on episode data creation rules which determine devices that have been used in association with each other, [[said]] the plurality of episode data having, as data, a plurality of the devices that have been used in association with each other;

an episode analysis unit operable to create, from the plurality of episode data, a frequent pattern tree representing, as a tree structure, a frequency at which the respective device sets are

used in association with each other; and

a life pattern interpretation unit operable to identify, according to the frequent pattern tree, a combination of device sets as life pattern information, ~~[[said]]~~ the device sets having a high frequency for being used in association with each other,

wherein, with regard to subtrees having ~~respective~~ nodes of the frequent pattern tree as roots, the episode analysis unit constructs the frequent pattern tree with a structure in which element data having a highest frequency becomes a root of a subtree, and

the life pattern interpretation unit identifies, based on the frequent pattern tree, a device A and a device B, which have a high frequency for being used in association with each other, as a combination having a high association frequency, even when each of ~~[[said]]~~ device A and

~~[[said]]~~ device B are combined and used in association with ~~various~~ other devices~~[[.]]~~ , and

wherein the episode analysis unit (i) creates new episodes by extracting subtrees having, as new roots, nodes which are offspring of a node equivalent to a root of the frequent pattern tree, tracking nodes within each of the extracted subtrees starting from the root, and combining element data stored in the nodes, (ii) recursively performs the subtree extraction and the episode creation on the created episodes until there are no more subtrees, and (iii) reconstructs the frequent pattern tree by integrating recursively constructed subtree frequent pattern trees, into positions in the frequent pattern tree.

**37. (Currently Amended)** A life pattern information generation method for generating, using a life pattern information generation apparatus, life pattern information for a device linkage control apparatus that controls a plurality of devices in linkage with each other based on the life pattern information, the method comprising:

~~a life data accumulation step of accumulating life data indicating a usage history of the plurality of devices;~~

~~an episode creation step of creating, from the life data, a plurality of episode data, based on episode data creation rules which determine devices that have been used in association with each other, [[said]]~~ the plurality of episode data having, as data, a plurality of the devices that

have been used in association with each other;

~~an episode analysis step~~ of creating, from the plurality of episode data, a frequent pattern tree representing, as a tree structure, a frequency at which ~~the respective device sets~~ are used in association with each other; ~~[[and]]~~

~~a life pattern interpretation step~~ of identifying, according to the frequent pattern tree, a combination of device sets as life pattern information, ~~[[said]]~~ the device sets having a high frequency for being used in association with each other,

wherein ~~the life data accumulation steps~~ said accumulating life data operation, said creating a plurality of episode data operation, said creating the frequent pattern tree operation, and said identifying operation, ~~the episode creation step, the episode analysis step, and the life pattern interpretation step,~~ are executed by the life pattern information generation apparatus,

with regard to subtrees having respective nodes of the frequent pattern tree as roots, the frequent pattern tree is constructed, in ~~the episode analysis steps~~ said creating a frequent pattern tree operation, with a structure in which element data having a highest frequency becomes a root of a subtree, and

in ~~the life pattern interpretation steps~~ said identifying operation, a device A and a device B which have a high frequency for being used in association with each other are identified, based on the frequent pattern tree, as a combination having a high association frequency, even when each of ~~[[said]]~~ device A and ~~[[said]]~~ device B are combined and used in association with ~~various other devices~~ [[,]]; and

creating new episodes by extracting subtrees having, as new roots, nodes which are offspring of a node equivalent to a root of the frequent pattern tree, tracking nodes within each of the extracted subtrees starting from the root, and combining element data stored in the nodes;

performing, recursively, the subtree extraction and said creating new episode operation on the created new episodes until there are no more subtrees; and

reconstructing the frequent pattern tree by integrating recursively constructed subtree frequent pattern trees, into positions in the frequent pattern tree.

**38. (Currently Amended)** A program for generating, using a life pattern information generation apparatus, life pattern information for a device linkage control apparatus that controls a plurality of devices in linkage with each other based on the life information, the program being held in a storage unit of ~~[[said]]~~ the life pattern information generation apparatus, and causing a CPU controlling operation of ~~[[said]]~~ the life pattern information generation apparatus to execute at least the following:

~~a life data accumulation step~~ of accumulating life data indicating a usage history of the plurality of devices;

~~an episode creation step~~ of creating, from the life data, a plurality of episode data, based on episode data creation rules which determine devices that have been used in association with each other, ~~[[said]]~~ the plurality of episode data having, as data, a plurality of the devices that have been used in association with each other;

~~an episode analysis step~~ of creating, from the plurality of episode data, a frequent pattern tree representing, as a tree structure, a frequency at which ~~the respective device sets~~ are used in association with each other; ~~[[and]]~~

~~a life pattern interpretation step~~ of identifying, according to the frequent pattern tree, a combination of device sets as life pattern information, ~~[[said]]~~ the device sets having a high frequency for being used in association with each other, wherein

with regard to subtrees having respective nodes of the frequent pattern tree as roots, the frequent pattern tree is constructed, in ~~the episode analysis step~~ said creating a frequent pattern tree operation, with a structure in which element data having a highest frequency becomes a root of a subtree, and

in ~~the life pattern interpretation step~~ said identifying operation, a device A and a device B which have a high frequency for being used in association with each other are identified, based on the frequent pattern tree, as a combination having a high association frequency, even when each of ~~[[said]]~~ device A and ~~[[said]]~~ device B are combined and used in association with ~~various~~ other devices; and

creating new episodes by extracting subtrees having, as new roots, nodes which are



offspring of a node equivalent to a root of the frequent pattern tree, tracking nodes within each of the extracted subtrees starting from the root, and combining element data stored in the nodes;  
performing, recursively, the subtree extraction and said creating new episode operation on the created new episodes until there are no more subtrees; and  
reconstructing the frequent pattern tree by integrating recursively constructed subtree frequent pattern trees, into positions in the frequent pattern tree.

**39. (Currently Amended)** A device linkage control apparatus that controls a plurality of devices in linkage with one another, which is used by being connected to a life data accumulating apparatus that accumulates life data indicating usage of the plurality of devices in [[a user's]] daily life of a user, the device linkage control apparatus comprising:

a life data accumulation unit operable to accumulate life data indicating a usage history of the plurality of devices;

an episode creation unit operable to create, from the life data, a plurality of episode data, based on episode data creation rules which determine devices that have been used in association with each other, [[said]] the plurality of episode data having, as data, a plurality of the devices that have been used in association with each other;

an episode analysis unit operable to create, from the plurality of episode data, a frequent pattern tree representing, as a tree structure, a frequency at which ~~the respective-device sets~~ are used in association with each other;

a life pattern interpretation unit operable to identify, according to the frequent pattern tree, a combination of device sets as life pattern information, [[said]] the device sets having a high frequency for being used in association with each other; and

a control unit operable to control, in linkage with each other, [[said]] the device sets having a high frequency for being used in association with each other,

wherein, with regard to subtrees having ~~respective~~ nodes of the frequent pattern tree as roots, the episode analysis unit constructs the frequent pattern tree with a structure in which element data having a highest frequency becomes a root of a subtree,

the life pattern interpretation unit identifies, based on the frequent pattern tree, a device A and a device B, which have a high frequency for being used in association with each other, as a combination having a high association frequency, even when each of [[said]] device A and [[said]] device B are combined and used in association with ~~various~~ other devices, and the control unit controls, in linkage with each other, at least [[said]] device A and [[said]] device B, and

wherein the episode analysis unit (i) creates new episodes by extracting subtrees having, as new roots, nodes which are offspring of a node equivalent to a root of frequent pattern tree, tracking nodes within each of the extracted subtrees starting from the root, and combining element data stored in the nodes, (ii) recursively performs the subtree extraction and the episode creation on the created episodes until there are no more subtrees, and (iii) reconstructs the frequent pattern tree by integrating recursively constructed subtree frequent pattern trees, into positions in the frequent pattern tree.

**40. (Currently Amended)** A life pattern information generating apparatus that generates life pattern information for a device linkage control apparatus controlling a plurality of devices in linkage with each other based on the life pattern information, the life pattern information generating apparatus being used by being connected to a life data accumulating apparatus that accumulates life data indicating usage of a plurality of devices in [[a user's]] daily life of a user, and comprises:

a life data accumulation unit operable to accumulate life data indicating a usage history of the plurality of devices;

an episode creation unit operable to create, from the life data, a plurality of episode data, based on episode data creation rules which determine devices that have been used in association with each other, [[said]] the plurality of episode data having, as data, a plurality of the devices that have been used in association with each other;

an episode analysis unit operable to create, from the plurality of episode data, a frequent

pattern tree representing, as a tree structure, a frequency at which the ~~respective~~ device sets are used in association with each other; and

a life pattern interpretation unit operable to identify, according to the frequent pattern tree, a combination of device sets as life pattern information, ~~[[said]]~~ the device sets having a high frequency for being used in association with each other,

wherein, with regard to subtrees having ~~respective~~ nodes of the frequent pattern tree as roots, the episode analysis unit constructs the frequent pattern tree with a structure in which element data having a highest frequency becomes a root of a subtree, and

the life pattern interpretation unit identifies, based on the frequent pattern tree, a device A and a device B, which have a high frequency for being used in association with each other, as a combination having a high association frequency, even when each of ~~[[said]]~~ device A and ~~[[said]]~~ device B are combined and used in association with ~~various~~ other devices, and

wherein the episode analysis unit (i) creates new episodes by extracting subtrees having, as new roots, nodes which are offspring of a node equivalent to a root of the frequent pattern tree, tracking nodes within each of the extracted subtrees starting from the root, and combining element data stored in the nodes, (ii) recursively performs the subtree extraction and the episode creation on the created episodes until there are no more subtrees, and (iii) reconstructs the frequent pattern tree by integrating recursively constructed subtree frequent pattern trees, into positions in the frequent pattern tree.

41. (New) The device linkage control apparatus according to claim 32,

wherein each of the nodes of the frequent pattern tree correspond to a different one of the devices that are to be controlled,

the life pattern interpretation unit identifies information indicating two or more of the different devices as the life pattern information, and

the control unit controls the two or more different devices indicated by the life pattern information that are in linkage with each other.